

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Naoki Mukaida et al.	Art Unit: 2185
Serial Number:	10/032,949	Examiner: Midys Rojas
Filed:	December 26, 2001	
Title:	Memory Controller, Flash Memory System Having Memory Controller and Method for Controlling Flash Memory Device	

Attorney Docket No.: 060233.00043

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Subsequent to the filing of the Notice of Appeal received by the U.S. Patent and Trademark Office on February 2, 2009, the Applicants now submit a Brief on Appeal in response to the Final Rejection set forth in the Office Action dated October 1, 2008. This Appeal Brief is being submitted in accordance with 37 C.F.R. §41.37 and is accompanied by the required fee of \$540.00 under §41.20(b).

The Office is authorized to charge or refund any fee deficiency or excess to Deposit Account No. 08-2789.

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I. Real Party in Interest

The real party in interest is TDK Corporation, to which an Assignment has been recorded at Reel 013098, Frame 0674 in the United States Patent and Trademark Office.

II. Related Appeals and Interferences

There are no related Appeals or Interferences.

III. Status of Claims

Claims 21-23 are pending in the subject application, with claims 21 and 23 in independent form. Claims 1-20 have been canceled. A full set of the pending claims is found in the Claims Appendix.

Claims 21-23 have been finally rejected under 35 U.S.C. §102(b) as being anticipated by Hiraka (U.S. Patent No. 5,987,573). Claims 21 and 23 also stand rejected to for various informalities.

Claims 21-23 are being appealed.

IV. Status of Amendments

No amendments have been filed subsequent to final rejection. All amendments have been entered and are reflected in the claims in the Claims Appendix.

V. Summary of Claimed Subject Matter

A. Independent claim 21

Independent claim 21 is directed to a memory controller for accessing a flash memory. The flash memory includes a plurality of physical blocks each having a plurality of pages in which stored data is erased in a unit of the physical block, based on a host address which is in a unit of a sector and supplied from a host computer. The memory controller includes search means for searching a start page in the physical block corresponding to the host address supplied from the host computer. The memory controller also includes determining means for determining whether a first page of a page or pages corresponding to the host address supplied from the host computer is either one of the searched start page and a page located after the searched start page, or not. The memory controller further includes write means for writing data supplied from the host computer into the page or pages corresponding to the host address supplied from the host computer when the determining means determines that the first page of a page or pages corresponding to the host address is the searched start page or the page located after the searched start page. Moreover, the memory controller includes start page information write means which writes start page information into a redundant area of the start page which is searched by the search means. The start page information represents a page which is next to a last page of the page or pages into which data will be written by the write means and become a new start page after the data is written by the writing means. The start page is a page next to the last page of a page or pages into which the data supplied from the host computer is written. The search means searches the start page by referring the start page information written in the redundant area.

Each element of independent claim 21 and support for each element in the specification is provided below in Table 1.

TABLE 1

Claim 21 elements	Support for the element in the specification
A memory controller for accessing a flash memory having a plurality of physical blocks each including a plurality of pages and in which stored data is erased in a unit of the physical block, based on a host address which is in a unit of a sector, supplied from a host computer, comprising:	Support for this element can at least be found at page 10, line 24 through page 11, line 20 and at page 17, lines 3 through 23, as well as throughout the application.
search means for searching a start page in the physical block corresponding to the host address supplied from the host computer;	Support for this element can at least be found at page 19, line 14 through page 20, line 2, as well as throughout the application.
determining means for determining whether a first page of a page or pages corresponding to the host address supplied from the host computer is either one of the searched start page and a page located after the searched start page, or not;	Support for this element can at least be found at page 41, lines 9-17, as well as throughout the application.
write means for writing data supplied from the host computer into the page or pages corresponding to the host address supplied from the host computer when the determining means determines that the first page of a page or pages corresponding to the host address supplied from the host computer is the searched start page or the page located after the searched start page; and	Support for this element can at least be found at page 41, line 18 through page 42, line 7, as well as throughout the application.

start page information write means which writes start page information into a redundant area of the start page which is searched by the search means, the start page information representing a page which is next to a last page of the page or pages into which data will be written by the write means and become a new start page after the data is written by the writing means;	Support for this element can at least be found at page 41, line 18 through page 42, line 7, as well as throughout the application.
wherein the start page being a page next to the last page of a page or pages into which the data supplied from the host computer is written; and	Support for this element can at least be found at page 42, lines 12-13, as well as throughout the application.
the search means searching the start page by referring the start page information written in the redundant area.	Support for this element can at least be found at page 40, line 26 through page 41, line 8, as well as throughout the application.

B. Independent claim 23

Independent claim 23 is directed to a memory control method for accessing a flash memory. The flash memory includes a plurality of physical blocks each having a plurality of pages in which stored data is erased in a unit of the physical block, based on a host address which is in a unit of a sector and supplied from a host computer. The memory control method includes the step of searching a start page in the physical block corresponding to the host address supplied from the host computer. The memory control method also includes the step of determining whether a first page of a page or pages corresponding to the host address supplied from the host computer is either one of the searched start page and a page located after the searched start page, or not. The memory control method further includes the step of writing data supplied from the host computer into the page or pages corresponding to the host address supplied from the host computer when determining that the page or pages corresponding to the host address supplied from

the host computer is the searched start page or the page located after the searched start page. Moreover, the memory control method includes the step of writing start page information into a redundant area of the start page at a time when starting writing data supplied from the host computer into the flash memory. The start page is a page next to the last page of a page or pages into which the data supplied from the host computer is written. The start page is searched based on the start page information by referring to the data written in the redundant area.

Each element of independent claim 23 and support for each element in the specification is provided below in Table 2.

TABLE 2

Claim 23 elements	Support for the element in the specification
A memory control method for accessing a flash memory having a plurality of physical blocks each including a plurality of pages and in which stored data is erased in unit of the physical block, based on a host address which is in unit of a sector, supplied from a host computer, comprising:	Support for this element can at least be found at page 10, line 24 through page 11, line 20 and at page 17, lines 3 through 23, as well as throughout the application.
searching a start page in a physical block corresponding to the host address supplied from the host computer;	Support for this element can at least be found at page 19, line 14 through page 20, line 2, as well as throughout the application.
determining whether first page or a page or pages corresponding to the host address supplied from the host computer is either one of the searched start page and a page located after the searched start page, or not;	Support for this element can at least be found at page 41, lines 9-17, as well as throughout the application.

writing data supplied from the host computer into the page or pages corresponding to the host address supplied from the host computer when determining that the page or pages corresponding to the host address supplied from the host computer is the searched start page or the page located after the searched start page; and	Support for this element can at least be found at page 41, line 18 through page 42, line 7, as well as throughout the application.
writing start page information into a redundant area of the start page when starting writing data supplied from the host computer into the flash memory;	Support for this element can at least be found at page 41, line 18 through page 42, line 7, as well as throughout the application.

VI. Grounds of Rejection to be Reviewed on Appeal

Claims 21-23 have been finally rejected under 35 U.S.C. §102(b) as being anticipated by Hiraka (U.S. Patent No. 5,987,573).

VII. Argument

A. Rejection of claims 21-23 under 35 U.S.C. § 102(b) as being anticipated by Hiraka

As the Office is aware, “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” MPEP § 2131, quoting *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, (Fed. Cir. 1987). Furthermore, the case *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970) held that “[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art.”

i. Claims 21 and 23

The rejection of independent claims 21 and 23 are being argued together as a group. However, for convenience, hereafter reference will only be made to the particular

language recited by claim 21.

It is respectfully suggested that claim 21 is simply not anticipated by Hiraka, as Hiraka does not disclose each and every element as set forth in these claims.

Claim 21 recites a search means for searching a start page in the physical block corresponding to the host address supplied from the host computer. The physical block is a unit of one of the flash memory chips. In the Office Action dated October 1, 2008, the Examiner asserts that Hiraka discloses such a search of a start page in the physical block. Specifically, the Examiner cites col. 4, lines 59-67 and col. 17, line 8-34 of Hiraka to show such a disclosure. However, it is respectfully suggested that this is not correct.

The passages cited by the Examiner describe searching “address conversion tables” and “empty block tables”. However, these tables are found in the flash table controller of Hiraka, which are part of the controller and not part of the flash memory chips. Simply put, the “empty block tables” are *tables* in the controller for searching for empty blocks, not the empty blocks of the flash memory chips themselves. Therefore, searching these tables is simply not analogous to the searching a start page in the physical block as recited by claim 1. As such, Hiraka does not disclose, teach, or suggest this step.

Claim 21 also recites a start page information write means, which writes start page information into a redundant area of the start page that is searched by the search means. Claim 21 further recites that the start page information represents a page which is next to a last page of the page or pages into which data will be written. The Examiner asserts that Hiraka teaches such start page information write means. Specifically, the Examiner cites col. 5, lines 29-36; col. 7, lines 24-40; and col. 11, lines 48-51 of Hiraka to show such a disclosure. However, it is respectfully suggested that this is not correct.

The first passage of Hiraka cited by the Examiner (col. 5, lines 29-36) describes a “block status” showing a good or bad quality of the block being written to a redundant region. The “quality” of the block is simply not the same as the start page information that represents “a page which is next to a last page of the page or pages into which data will be written.” The second passage cited by the Examiner (col. 7, lines 24-40), refers to reading a “conversion table address”. However, this “conversion table address” of Hiraka is not the same as the start page information which represents a page which is next to a last page of the page or pages where data is to be written. Furthermore, this second passage is in reference to reading data, not writing start page information, as is recited by claim 21. The third passage cited by the Examiner also fails to disclose, teach, or suggest the start page information write means.

Based on the above, the Applicants respectfully submit that the Examiner’s position that claims 21 and 23 are anticipated by Hiraka is clearly in error, and respectfully request relief from the Board relative to the Examiner’s position. Furthermore, the Applicants respectfully submit that claims 21 and 23 are both novel and nonobvious in view of the prior art, and are therefore allowable.

ii. Claim 22

Claim 22 depends directly from claims 21. As such, it is respectfully submitted that this claim is also allowable.

The Commissioner is authorized to charge the Deposit Account No. 08-2789, in the name of Howard & Howard Attorneys PLLC for any additional fees or credit the

account for any overpayment.

Respectfully submitted,

HOWARD & HOWARD ATTORNEYS PLLC

April 2, 2009

Date

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VIII. Claims Appendix

21. (Previously Presented) A memory controller for accessing a flash memory having a plurality of physical blocks each including a plurality of pages and in which stored data is erased in a unit of the physical block, based on a host address which is in a unit of a sector, supplied from a host computer, comprising:

search means for searching a start page in the physical block corresponding to the host address supplied from the host computer;

determining means for determining whether a first page of a page or pages corresponding to the host address supplied from the host computer is either one of the searched start page and a page located after the searched start page, or not;

write means for writing data supplied from the host computer into the page or pages corresponding to the host address supplied from the host computer when the determining means determines that the first page of a page or pages corresponding to the host address supplied from the host computer is the searched start page or the page located after the searched start page; and

start page information write means which writes start page information into a redundant area of the start page which is searched by the search means, the start page information representing a page which is next to a last page of the page or pages into which data will be written by the write means and become a new start page after the data is written by the writing means; wherein

the start page being a page next to the last page of a page or pages into which the data supplied from the host computer is written; and

the search means searching the start page by referring the start page information

written in the redundant area.

22. (Previously Presented) A flash memory system having a flash memory and the memory controller as set forth in claim 21.

23. (Previously Presented) A memory control method for accessing a flash memory having a plurality of physical blocks each including a plurality of pages and in which stored data is erased in unit of the physical block, based on a host address which is in unit of a sector, supplied from a host computer, comprising:

searching a start page in a physical block corresponding to the host address supplied from the host computer;

determining whether first page or a page or pages corresponding to the host address supplied from the host computer is either one of the searched start page and a page located after the searched start page, or not;

writing data supplied from the host computer into the page or pages corresponding to the host address supplied from the host computer when determining that the page or pages corresponding to the host address supplied from the host computer is the searched start page or the page located after the searched start page; and

writing start page information into a redundant area of the start page when starting writing data supplied from the host computer into the flash memory;

the start page being a page next to a last page or pages into which the data supplied from the host computer is written;

the start page being searched based on the start information by referring the data

written in the redundant area.

IX. Evidence Appendix

None.

X. Related Proceedings Index

None.